

Caring for the TBI Patient at Home

**Satellite Conference
Wednesday, September 21, 2005
2:00 - 4:00 p.m. (Central Time)**

Produced by the Alabama Department of Public Health
Video Communications Division

Faculty

Paula J.B. Stewart, MD
Medical Director
Healthsouth Lakeshore
Rehabilitation Hospital
Birmingham, Alabama

Janice Waters
Respite Care Coordinator

Sandy B. Koplon, MA
Director of Community Outreach
Alabama Head Injury Foundation

Program Objectives

- Define Traumatic Brain Injury (TBI).
- List the most frequent cases of TBI.
- Discuss home care for the patient with TBI.

TBI: Dimensions of the Problem

- 300,000 Americans hospitalized annually
 - 52,000 deaths
 - 90,000 residual impairments

TBI: Dimensions of the Problem

Incidence per Million		Residual Disability %
• Mild	1360	• 10%
• Moderate	158	• 67%
• Severe	71	• 100%

TBI: Costs

- Total national cost - \$48.25 billion
 - Support costs for survivors - \$31.7 billion
 - Inpatient rehab - \$1.15 billion
 - Nursing Home - \$350 million
 - Home modifications - \$62 million
 - Vocational Rehabilitation - \$4 million

Causes of TBI with Hospitalization

- | • Cause | • Percentage |
|------------|--------------|
| – MVC | – 50% |
| – Falls | – 20% |
| – Assaults | – 20% |
| – Sports | – 10% |

Other Causes of Non-traumatic Brain Injury

- Cause
 - Lack of oxygen
 - Poisoning
 - Infection
 - Degenerative causes

TBI: Some Good News

- Death rates from TBI have declined from 1980 to 1995 in part due to improved safety measures and helmet laws.
 - 25 per 100,000 1980 to
 - 19 per 100,000 1995

TBI: Types of Injury

- Focal injury
- Diffuse axonal
- Hypoxic-ischemic
- Increased intracranial pressure
- Secondary injury

Neuromedical Complications in TBI

- Injuries associated with the trauma such as fractures, spinal cord injury, visceral injury, soft tissue injury
- Complications related to immobility such DVT, pressure sores, impactions, osteoporosis, heterotopic ossification
- Complications related to brain injury such as seizures, spasticity, endocrinopathies

Neuromedical Complications in TBI (Dobkin)

- Skin
 - Pressure ulcers
 - Acne, seborrhea, folliculitis
 - Sweating disorders
 - Drug reactions
 - Infections
 - Edema
 - Cosmetic deformity

Neuromedical Complications in TBI (Dobkin)

- Eye
 - Corneal ulcer secondary to lid paralysis
 - Infection
 - Eye socket fracture and double vision
 - Loss of visual acuity or blindness
 - Field cuts

Neuromedical Complications in TBI (Dobkin)

- Ear
 - Infection
 - Drainage of fluid from the ear
 - Hearing loss

Neuromedical Complications in TBI (Dobkin)

- Nose
 - Trauma with obstruction or deformity
 - Infection
 - Loss of smell and taste

Neuromedical Complications in TBI (Dobkin)

- Mouth
 - Wired jaw after fracture
 - Bruxism or teeth grinding
 - Loss of teeth
 - Oral infections
 - Dysphagia or problems swallowing

Neuromedical Complications in TBI (Dobkin)

- Throat
 - Vocal cord injury with changed voice quality or inhaling food or fluids into the lungs
 - Complications from tracheostomy such as scarring and narrowing of the trachea, erosion, fistula, infection

Neuromedical Complications in TBI (Dobkin)

- Lungs
 - Blood clots
 - Pneumonia
 - Atelectasis
 - Flail chest
 - Lung trauma
 - Collapse of the lung
 - ARDS-Adult respiratory distress syndrome
 - Pulmonary edema

Neuromedical Complications in TBI (Dobkin)

- **Gastrointestinal**
 - Peptic ulcer
 - Loss of blood flow to the gut
 - Gastroparesis
 - Reflux esophagitis
 - Diarrhea, ie C. Diff
 - Impactions
 - Incontinence
 - Feeding tubes
 - Pancreatitis

Neuromedical Complications in TBI (Dobkin)

- **Cardiac**
 - Trauma
 - Pericardial effusion or fluid and blood surrounding the heart
 - Heart failure
 - Arrhythmias

Neuromedical Complications in TBI (Dobkin)

- **Peripheral Vascular System**
 - DVT or blood clots in the limbs or pelvis
 - Hypotension
 - Hypertension
 - Limb lack of blood flow
 - Compartment syndromes

Neuromedical Complications in TBI (Dobkin)

- **Genitourinary System**
 - Infection
 - Neurogenic bladder
 - Catheter complications
 - Bladder or kidney trauma
 - Incontinence
 - Sexual dysfunction

Neuromedical Complications in TBI (Dobkin)

- **Female Reproductive System**
 - Infection
 - Amenorrhea or loss of menstruation
 - Oligomenorrhea or reduced menstruation
 - Trauma

Neuromedical Complications in TBI (Dobkin)

- **Metabolic-endocrine System (4%)**
 - Hypothalamic-pituitary failure
 - SIADH-syndrome of inappropriate antidiuretic hormone
 - Salt wasting
 - Hypothyroidism
 - Uremia
 - Malignant Hyperthermia
 - Central fever

Neuromedical Complications in TBI (Dobkin)

- Hematologic System
 - Anemias
 - Coagulopathies
 - Sepsis

Neuromedical Complications in TBI (Dobkin)

- Musculoskeletal
 - Steroid myopathy-causing muscle weakness
 - Disuse atrophy
 - Heterotopic ossification
 - Osteomyelitis or bone infection
 - Fractures
 - Soft tissue injury with pain
 - Osteoporosis

Neuromedical Complications in TBI (Dobkin)

- CNS
 - Encephalopathy
 - Drug induced
 - Metabolic disorder
 - Infection

Neuromedical Complications in TBI (Dobkin)

- CNS
 - Pain Syndromes
 - CRPS-complex regional pain syndrome
 - Headaches
 - Radiculopathies
 - Neuromas

Neuromedical Complications in TBI (Dobkin)

- CNS
 - Other syndromes
 - Autonomic “storming”
 - Movement disorders
 - Cranial Neuropathies
 - Vertigo
 - Dysarthria-slurred speech
 - Dysphagia-problems swallowing
 - Drooling
 - Diplopia-double vision
 - Hearing loss
 - Optic nerve injury

Neuromedical Complications in TBI (Dobkin)

- Peripheral Nervous System
 - Local nerve injury-single nerves or nerve roots

Impairments in Severe TBI

• Impairment	Percentage
– Cognition	60-90 %
– Hemiparesis	40-60 %
– Dysarthria	50 %
– Cranial Neuropathy	30 %
– Dysphagia	30 %
– Ataxia	30 %
– Aphasia	10 %
– Hemianopsia	5 %

Recovery in TBI

- Mechanisms
 - Acute resolution of hemorrhage, edema and metabolic derangement
 - Neuroregeneration
 - Neural Reorganization

Recovery in TBI

- Interventions
 - Acute
 - Prevent secondary injury
 - Post-acute
 - Therapy
 - Drug Facilitation

Pharmacologic Approaches in TBI

- New evidence that pharmacologic intervention may potentially aid recovery in two ways. First prevent death of newly regenerated neurons and secondly facilitate neural reorganization.

Pharmacologic Approaches in TBI

- Beneficial drugs
 - Sympathomimetic (i.e. stimulants such as D-amphetamine, Ritalin)
 - Dopamine agonists
 - SSRIs
 - Memory enhancers

Pharmacologic Approaches in TBI

- Sympathomimetic Drugs
 - Evidence
 - Whyte et al.
 - 90 days post TBI living at home
 - Ritalin .3mg/kg
 - Alternate Ritalin vs placebo randomly on a weekly basis
 - Improved performance on tasks requiring speed and caregivers noted improved attention and organization

Pharmacologic Approaches in TBI

- SSRIs
 - Zoloft most often studied. Unclear if Paxil, Prozac, Lexapro, Effexor, Celexa have equal benefits.
 - Effects are to increase brain activation during motor activity
 - Focal brain activation correlates with improvement in function
 - Some evidence that they may reduce apoptosis

Pharmacologic Approaches in TBI

- Others
 - Nimodipine (Nimotop) increases attention
 - Nootropics
 - Memantine (Namenda)
 - Pentoxifyline (Trental)
 - Ginkgo Biloba
 - Cholinesterase Inhibitors
 - Aricept
 - Exelon
 - Reminyl

Pharmacologic Approaches in TBI

- Harmful drug interventions
 - Alpha-adrenergic antagonists
 - Phenobarbital
 - Benzodiazepines
 - Phenytoin
 - Phenothiazines

Pharmacologic Approaches in TBI

- Harmful drug interventions
 - Substitutions to consider
 - Dilantin=> Carbamazepine
 - Haldol=> Hydroxyzine, Inderal, possibly atypical neuroleptics

Therapeutic Interventions in TBI- Mild

- Mild TBI
 - Majority of TBI
 - Good recovery 90%
 - 10% “miserable minority” with residual headache, memory dysfunction, emotional disturbance, visual disturbance. Often unable to resume previous employment.
 - Rarely inpatient Rehab unless associated multiple trauma

Therapeutic Interventions in TBI- Moderate

- Moderate TBI
 - About 30% make a good recovery. Recovery dependent upon age, mechanism of injury, availability and duration of rehab.
 - Typically benefit from full Brain Injury team approach with Psychiatrist, Rehab RN, P.T., O.T., Speech Therapy, Psychology, Music Therapy, Recreational Therapy and Case Management

Therapeutic Interventions in TBI- Moderate

- **Moderate TBI**
 - **Rehab RNs:** Training in managing the agitated patient, managing bowel, bladder, wound, nutritional issues and positioning for the spastic and/or immobile patient. Educate family on management.

Therapeutic Interventions in TBI- Moderate

- **Moderate TBI**
 - **Rehab Physical Therapy:** Focus on mobility. If appropriate will strengthen and increase endurance for functional mobility, teach the use of adaptive equipment for mobility, i.e. canes, walkers, orthotics, and wheelchairs. Modalities for pain and tone reduction.

Therapeutic Interventions in TBI- Moderate

- **Moderate TBI**
 - **Occupational Therapy:** Self cares and ADLS. Upper extremity and hand function. Adaptive equipment for compensation of lost ability. Splinting, and modalities for tone reduction and pain management. Visual screening. Cognitive assessment.

Therapeutic Interventions in TBI- Moderate

- **Moderate TBI**
 - **Speech Therapy:** Address dysphagia, dysarthria, aphasia, dyslexia and cognitive dysfunction. Use Vital Stim to strengthen the strap muscles of swallowing.

Therapeutic Interventions in TBI- Moderate

- **Moderate TBI**
 - **Psychology:** Assesses the emotional and neuropsychological status of the patient. Addresses substance abuse issues and follow-up. Identifies PTSD. Addresses adjustment issues. Provides family support and counseling.

Therapeutic Interventions in TBI- Moderate

- **Moderate TBI**
 - **Music Therapy:** Works on gross motor and fine motor functioning of the upper extremities. Multi dimensional cognitive therapies which address memory, sequencing, auditory processing, coordination, and language skills.

Therapeutic Interventions in TBI- Moderate

- **Moderate TBI**
 - **Recreational Therapy:** Uses avocational interests to enhance function, and cognition (i.e., table top activities, pool therapy or sports involvement and community activities to enhance community reintegration.)

Therapeutic Interventions in TBI- Moderate

- **Moderate TBI**
 - **Case Management:** Liason with family and team. Coordinates all aspects of the patient's post discharge care and contacts community resources for follow-up: VRS, Driving Evals, Neuropsych testing, Neuro-optomologic follow-up, MD follow up, attendants, equipment, BIA, etc.

Therapeutic Interventions in TBI-Severe

- **Severe TBI**
 - Severe TBI has 0% good outcomes. Often very medically involved. Improvement in all areas expected but these patients will typically require supervision for the remainder of their lives.
 - Heavy emphasis on family training and finding resources to assist.

Therapeutic Interventions in TBI-Post-inpatient Rehab

- **Therapies**
 - Home health
 - Outpatient
 - Community programs: Lakeshore Foundation

Therapeutic Interventions in TBI-Post-inpatient Rehab

- **Tone Management**
 - Medication adjustment
 - Botox
 - Baclofen pump
 - Surgical interventions

Therapeutic Interventions in TBI-Post-inpatient Rehab

- **CIMT**
 - 20-50% improvement in the use of a hemiparetic hand with 3-6 hours of intensive therapies daily for 2-6 weeks. Primarily stroke patients however a selected group of TBI patients have benefited.

Issues for the Home Health Caregiver

- Understanding how life has changed for the TBI patient
 - Loss of social contact with friends
 - Loss of control
 - Loss of independence
 - Lack of self awareness
 - Change of role in the family
 - Loss of self-worth

Issues for the Home Health Caregiver

- Understanding how life has changed for the TBI patient caregiver
 - Caregiver provides care and supervision
 - Life revolves around the needs of patient
 - Caregiver is often unable to return to work
 - Families experience financial hardship
 - Caregiver also socially isolated- tries to compensate

Issues for the Home Health Caregiver

- Understanding how life has changed for the TBI patient caregiver
 - Caregiver ignores psychological and physical health
 - Caregivers often become depressed, exhausted and experience health problems
 - Family relationships become stressed

Issues for the Home Health Caregiver

- Understanding how life has changed for the TBI patient caregiver
 - The TBI patient may exhibit
 - Diminished insight
 - Socially inappropriate language and behavior
 - Inability to express self
 - Impulsivity and impatience
 - Mood swings

Issues for the Home Health Caregiver

- Understanding how life has changed for the TBI patient caregiver
 - The TBI patient may exhibit
 - Depression
 - Lack of emotion
 - Loneliness
 - Intolerance
 - Anxiety
 - Fatigue
 - Emotional outbursts
 - Egocentricity

Issues for the Home Health Caregiver

- Approaches to the agitated patient
 - Redirection- do not confront
 - Low stimulation- turn off the TV, radio, stereo, etc and create a quiet, dark environment for the patient to be in
 - Medication- communicate with physician about problems in order to initiate some medication interventions
 - Enclosure beds are now paid for in the home setting

Issues for the Home Health Caregiver

- Approaches to the sexually inappropriate patient
 - Redirect behavior in a matter of fact way
 - move hands gently but firmly away
 - state calmly that the behavior is not acceptable and redirect to a different behavior

Conclusion

- Caring for the TBI patient in the home can present many challenges. However understanding the consequences of TBI and anticipating the potential medical complications and behavioral difficulties helps in meeting the challenge.

**“That which makes us most
human is most vulnerable to
head injury.”
- Rath**

Resources

Sandy Koplon
205-823-3818
1-800-433-8002
sandykoplon@bellsouth.net

Alabama Head Injury Foundation

Purpose: To improve the quality of life for people who have survived traumatic brain injuries and their families.

Services:

- Resource Coordination
- Respite Care Program
- Housing Assistance
- Social/Recreational Program
- Camp Program
- Advocacy
- Support Groups
- Supported Living
- Information and Resources
- Volunteer Opportunities